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(54) Title: IMPROVEMENTS IN, OR RELATING TO, CELLULAR RADIO COMMUNICATION SYSTEMS

(57) Abstract

A cellular radio communication system including a cellular radio communication network, such as GSM, adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations. The system includes at least one portable graphic display unit, for example, a portable personal computer (PPC), such as a laptop computer, adapted to communicate with the network, via a mobile station, using SMS and, in response to receipt of SMS messages, to selectively display stored graphic images and to selectively superpose stored geographically related information symbols on a displayed image. The information symbols, superposed on a displayed map image, are continually updated with current information by the SMS messages. The graphic images and symbols are preferably stored by the PPC, for example, on a CD-ROM and/or hard disc.

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IMPROVEMENTS IN, OR RELATING TO, CELLULAR RADIO COMMUNICATION SYSTEMS

The invention relates to a cellular radio communication system, including
5 cellular radio communication network, such as a Global System for Mobile
Communication (GSM) network, that is adapted to present geographically
related information to system users and, in particular, to such systems that offer
a 'short message service' (SMS) for updating the geographically related
information. The invention also relates to a method for distributing and
10 displaying geographically related information using SMS messages.

The mobile cellular radio communication network, known as GSM, which
is covered by standards developed and promulgated by the European
Telecommunications Standards Institute (ETSI), offers a variety of services to
15 users, other than voice, including, inter alia, data services, short message
services, and broadcast services. The ETSI GSM Standards specify, in addition
to the radio interface, a complete telecommunications network with radio access
by the user. Since the architecture, and operational aspects, of GSM are well
known to persons skilled in the art, only those aspects of GSM which are of
20 direct relevance to the present invention will be covered by this patent
specification.

SMS is a feature which is incorporated into digital mobile telephone
networks, and can be divided into two types, point-to-point services (SMS-PP),
25 and broadcast services (SMS-CB).

SMS-PP allows a brief message (up to 160 characters) to be sent
between a mobile telephone and a Service Centre (SC). Larger messages can
optionally be created by concatenating multiple messages (the protocol allows
30 up to 10 messages to be concatenated in this way). The SC operates in a store

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and forward manner, being able to send, or receive, messages from a wide variety of sources, in addition to a GSM mobile telephone, for example, fax, normal telephone, dial up modems, public, or private data networks etc.. This means that the service is not limited to sending messages between GSM mobile telephones, but can be used to send, or receive, messages from the wider telecommunications network.

Messages are handled in the SC in a store and forward manner. This means that when a message is received in the SC, it will be stored in the SC and will be forwarded onto the ultimate destination when the destination is able to receive it. Therefore, a message can be sent to a telephone which is currently switched off, and the SC will store the message until such time as the telephone is switched on again. Mechanisms exist throughout the GSM infrastructure for informing the SC that a telephone, for which it has a pending message, is now available. Options also exist for informing the originator that the message has been received at the destination.

The telephone messages can be stored either in non-volatile memory in the telephone, or in the SIM card. These can be messages created by the user, or can be messages received from the SC. Normally, when a message is received, it will be stored either in the telephone, or the SIM, and an indication given to the user that a new message has been received. The user can then retrieve the message from the telephone and display it. As an option, the message can also be coded by the originator so that it is immediately displayed rather than stored.

SMS-CB allows the network to broadcast messages to any interested user. A message is simply broadcast repeatedly at intervals until such time as it is no longer valid. Messages can consist of up to 15 pages, and the same message may be broadcast in multiple languages. Each message has a

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sequence number, meaning that when a message is updated the telephone can tell when an updated message is being received. The messages can also be tagged showing the geographical scope of their validity. For example, they can be tagged as being valid over the entire network (e.g. news flashes), over one 5 region within the network (e.g. traffic information), or over just a single cell (e.g. cell identity information).

It is very important, when travelling, i.e. in mobile situations, for the person concerned to have access to current information relating to the place 10 where he/she is presently located and to be able to present the information in a very easily understandable manner. An ideal method of achieving this would be to superpose information consisting of symbols on a graphic map image. For effective operation of this method, provision must be made for the information to be distributed, i.e. updated, on an on-going basis and as speedily as possible. 15 An ideal medium for effecting distribution/updating of the information would be a radio-based information distribution system having a required geographical coverage. However, the problem with systems of this type is that they only offer a very limited bandwidth. There is, therefore, a need for a technical solution to this problem that uses a bandwidth which does not encroach on the space 20 available for speech traffic but which can cope with the updating of the graphic map image in an effective manner. Furthermore, the technical solution to the problem needs to be based on standard components in order to make it attractive to a wide range of consumers.

25 It is an object of the present invention to provide a solution to the technical problem, outlined above, through the use of a cellular radio communication system, such as a GSM system, that is adapted to present geographically related information to system users, for example, on a display screen of a portable personal computer (PPC). In particular, the displayed 30 information is updated through use of a 'short message service' (SMS) provided

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by the radio-based system.

It is another object of the present invention to provide a method for distributing and displaying geographically related information using a cellular 5 radio communication system that offers a SMS service.

According to a first aspect of the present invention, there is provided, a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable graphic display unit adapted to communicate with said network, via a mobile station, using said short message 10 service (SMS) and, in response to receipt of SMS messages, to selectively display stored graphic images and to selectively superpose stored geographically related information symbols on a displayed image. The said at 15 least one graphic display unit may form part a portable personal computer (PPC), in which case, the PPC is adapted to communicate with said network, via a mobile station, using the short message service (SMS). The graphic map 20 images and symbols are preferably stored by the PPC.

According to a second aspect of the present invention, there is provided, a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable personal computer (PPC) adapted to 25 communicate with a mobile station using said short message service (SMS), 30

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said PPC including a display screen; storage means having stored therein a series of graphic map images and a number of geographically related information symbols for selective display on said display screen, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and selection means, responsive to receipt of SMS messages, for selectively retrieving a map image and symbols from said storage means for display on said display screen.

10 Preferably, the information symbols, superposed on a displayed map image, are continually updated with current information by the SMS messages.

The graphic map images and information symbols may be stored in a CD-ROM and/or a hard disc, which may form part of a PPC.

15 Preferably, the stored information symbols are predefined and adapted for various applications, and the SMS message define at least one symbol required to be displayed, together with its geographic coordinates. The PPC is preferably adapted, on receipt of the SMS message, to superpose the said at least one symbol on a graphic map image of the geographic area concerned, at 20 a position defined by said geographic coordinates.

A SMS cell broadcast facility may be used to distribute messages defining geographically related information considered to be of general application by a network operator. With this facility, SMS messages are used to continually 25 updated information symbols, superposed on a displayed graphic map image, with current information. The SMS cell broadcast facility may be adapted to limit the volume of distributed information by transmitting a number of SMS messages, for different applications, over different geographic locations. In addition, the SMS messages may be repeatedly broadcast, at intervals, for a 30 period of time during which a message is valid. Furthermore, the SMS

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messages may include an indication, identifiable by a mobile station, that previously transmitted information is being updated.

5 The SMS cell broadcast facility may be used for the distribution of messages concerning the current weather situation, in different geographic areas; local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies, bank, retail outlets and the like; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the race.

10 Alternatively, the SMS messages may be addressed to unique users, or groups of users, and the SMS messages may define geographic related information selected by a network user. This geographically related information may be in respect of a limited geographic area. The limited geographic area 15 may be local to a user, or group of users, for whom the information has been requested, the geographic limits being indicated either manually, or through use of a mobile station position-fixing facility. The manual indication may be given by an area marked on a synoptical map by said user, or group of users.

20 The limited geographic area may be local to a user, or group of users, for whom the information has been requested, and a mobile station of said user, or each member of said group of users, may be provided with a GPS receiver for determining said mobile station's geographic location. With this arrangement, each mobile station is adapted to transmit the respective location information to 25 a service provider using the SMS message facility.

30 The SMS messages addressed to unique users, or groups of users, may be adapted for use during military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of other taxis in the same taxi fleet.

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According to a third aspect of the present invention, there is provided, in a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS), in which said network includes a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, a method for distributing and displaying geographically related information using SMS messages, characterised by the steps of storing a series of graphic map images and a number of geographically related information symbols for selective display on a portable display unit, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and, in response to receipt of SMS messages from said network, retrieving and displaying a stored map image and symbols defined by said SMS messages. The method may be further characterised by the step of continually updating the information symbols, superposed on a displayed map image, with current information defined by said SMS messages. The storage of said graphic map images and information symbols may effected by a CD-ROM and/or a hard disc, which may form part of a PPC.

In a preferred method, the stored information symbols are predefined and adapted for various applications, in which case a SMS message defines at least one symbol required to be displayed, together with its geographic coordinates, and, on receipt of said SMS message, said at least one symbol is superposed on a displayed graphic map image at a position defined by said geographic coordinates.

The information symbols may include text information and an arrow adapted to be pointed at geographic coordinates of a map image defined by an SMS message.

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The method may be further characterised by distributing SMS messages using a SMS cell broadcast facility of said network, said distribute messages defining geographically related information considered to be of general application by a network operator. This method may include the step of using said SMS messages to continually update information symbols, superposed on a displayed graphic map image, with current information. The method may also include the step transmitting a number of SMS messages, for different applications, over different geographic locations, in order to limit the volume of distributed information by each of said SMS messages. The method may also include the step of repeatedly broadcasting said SMS messages, at intervals, for a period of time during which a message is valid.

Preferably, the method includes, in said SMS messages, an indication, identifiable by a mobile station, that previously transmitted information is being updated.

In a preferred method, the SMS cell broadcast facility is used for the distribution of messages concerning the current weather situation, in different geographic areas: local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the race.

The method may be further characterised by the step of addressing said SMS messages to unique users, or groups of users, and the SMS messages may define geographic related information selected by a network user. The geographically related information may be for a limited geographic area, the limited geographic area may be local to a users, for whom the information has been requested, and the geographic limits may be indicated either manually, or through use of a mobile station position fixing facility. The manual indication

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may be given by marking an area on a synoptical map.

When the limited geographic area is local to a user, or group of users, for whom the information has been requested, a mobile station of said user, or each member of said group of users, may be provided with a GPS receiver, in which case, the method may include the steps of determining a geographical location of a mobile station using said GPS receiver, and transmitting said location information to a service provider using said SMS message facility.

10 The method of addressing SMS messages to unique users, or groups of users, is preferably used during military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of other taxis in the same taxi fleet.

15 The cellular radio communication network is preferably a GSM network.

According to a fourth aspect of the present invention, there is provided an arrangement for distributing and displaying geographically related information using a SMS message facility of a cellular mobile radio communication network, characterised in that said arrangement is adapted to operate in accordance with a method as outlined in preceding paragraphs, or uses a system as outlined in preceding paragraphs

25 According to a fifth aspect of the present invention, there is provided a receiver for use with a system as outlined in preceding paragraphs, characterised in that said receiver includes a transceiver; storage means for storing a series of graphic map images and a number of geographically related information symbols for selective display, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and display means for displaying said

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graphic map images and said symbols, responsive to communication with said transceiver. The transceiver is preferably a GSM transceiver adapted to receive and transmit SMS messages defining geographically related information. The transceiver may include a GPS receiver.

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The foregoing and other features of the present invention will be better understood from the following description of specific embodiments of the present invention.

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It will be seen from the subsequent description that the present invention provides a solution to the technical problem, outlined in preceding paragraphs, through the use of a cellular mobile radio communication system including a cellular mobile radio communication network, such as GSM, in association with at least one portable personal computer (PPC), for example, a laptop computer, adapted for communication with a subscriber's cellular mobile telephone handset. It will be seen from the subsequent description that the mobile telephone handset is used to transfer geographically related information, received from the cellular mobile radio communication network, to the PPC for display.

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The PPC of the present invention includes storage means for storing graphic map images and symbols, adapted for various applications, to convey geographically related information to a user of the PPC, means for retrieving the map images and symbols from the storage means, and a display screen for displaying a retrieved symbol, or symbols, superimposed on a retrieved graphic map image. The storage means may, for example, be a CD-ROM and/or a hard disc. Thus, in addition to the permanent/semi-permanent data storage in a CD-ROM, variable data could be stored on a hard disc, with the contents of both of these storage arrangements being selectively accessible for display.

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The various applications for which the symbols may be used include, inter alia, weather, traffic information, tourist information, and information on a wide range of facilities, such as filling stations, banks, retail outlets, and other facilities that are likely to be of interest to individuals, when travelling. The 5 symbols may also include textual information and an arrow adapted to be pointed at geographic coordinates of a map image, i.e. for pointing at, and giving information in respect of, a selected region of a displayed map to which the received information relates.

10 Thus, the PPC's software is adapted, on receipt of details concerning map references, i.e. map coordinates, and geographically related information required by, or of interest to, a user of the PPC, via a mobile telephone connected thereto, to:

- 15 - identify and retrieve, from the storage means, a graphic map image for the geographic area where the user of the PPC is currently located and to which the received information relates;
- 20 - display the retrieved image on the PPC's display screen;
- identify and retrieve, from the storage means, a symbol, or symbols, representative of the geographically related information required by, or of interest to, the user of the PPC; and
- 25 - arrange (superpose) the retrieved symbol(s) on the displayed map image at an appropriate geographic location, or locations.

30 In order to enable the graphic map images to be continuously updated with current information, in a simple and effective manner, the present invention is adapted to distribute details of the symbols and their geographic coordinates

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by means of a cellular mobile communication network, such as GSM, having a SMS facility. Thus, the geographically related information is transmitted to a PPC, via a mobile telephone handset, for display.

5 Distribution of the updating information to a user's PC can, for example, be effected in either of the following ways:

- a SMS cell broadcast service; or
- 10 - SMS messages addressed to unique users, or groups of users.

The SMS cell broadcast service is adapted to distribute symbol information considered by a network operator to be of general application. With this distribution method, the volume of distributed information can be limited 15 through the transmission of a number of SMS messages, for various information, over different geographic areas (LAI base stations). As stated above, the broadcasting message service, SMS-CB, allows messages to be repeatedly broadcast, to users of the cellular mobile communication system, for example, mobile telephone users, at intervals, for a period of time during which the 20 message is valid. Furthermore, the messages can be broadcast in multiple languages and/or can include an indication, identifiable by a mobile telephone, that it has been updated, and/or as to its geographic scope, for, example, the entire cellular network, or a specific region(s) within the cellular network, or a single cell of the network.

25 It will be directly evident to persons skilled in the art that a subscriber service based on SMS cell broadcasting is well-suited to applications intended to reach many users/subscribers, without unduly loading a cellular radio communication system, such as GSM. This service may, for example, be 30 advantageously used for the following public applications:

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(a) The current weather situation, in different geographic areas (obtainable from an appropriate weather forecasting centre).

(b) Local tourist information.

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(c) Road information (obtainable from a National Road Transport Department).

10 (d) Traffic information (obtainable from the police, or a motoring organisation).

(e) The geographic locations of petrol filling stations, banks, retail outlets and the like (obtainable from different organisations/companies operating such facilities).

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(f) The availability of hotel vacancies.

(g) In a sailing boat race, the positions of all participating boats can be distributed.

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As for the distribution method in which messages are addressed to unique users, or groups of users, a user can send a SMS message to a service provider informing the service provider that a specific type of information is required and that only information for a limited geographic area, i.e. local information, should be distributed. The geographic limits of the local area can be indicated either manually, i.e. by the user marking an area on a synoptical map, or through use of a mobile telephone position-fixing facility, for example, the mobile telephone position-fixing options of a GSM network. As an alternative, a mobile telephone can be provided with a GPS receiver that is adapted to determine the geographic coordinates of the mobile telephone which

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can then be transmitted, via SMS, to the service provider.

The sending of geographically related SMS messages to various users, or groups of users, may, for example, be advantageously used for the following applications:

(a) During military exercises. This will provide an ideal means of obtaining a general overview of the current situation in the field.

(b) Police forces on reconnaissance. This would enable the police to obtain an overview of where other police cars are located in the vicinity.

(c) Fire-fighters fighting a forest fire. A graphic map image could provide an updated picture of the fire's extent and where other fire-fighters are located.

(d) A taxi driver could use the service to determine where his/her company's other cars are located.

It will be seen from the foregoing description that the present invention enables general map images and corresponding information stored, for example, in a portable personal computer (PPC), such as a laptop computer, to be kept updated by using GSM-SMS technology. In other words, the invention uses locally (PPC) stored graphical information, i.e. maps and geographically related information symbols, which can be controlled by a service provider linked to a mobile telephone network, such as a GSM network, by means of a GSM-SMS cell broadcast facility.

Since the graphic map images and symbols are already held by a PPC connected to a network user's mobile telephone station, a particular advantage

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of the present invention is that a relatively large amount of information can be transmitted on a single narrow-band channel. The reason for this is that the symbols can be arranged (superposed) on a graphical map image by sending only symbol references, i.e. types and coordinates, to a user's PPC, via a mobile telephone handset.

It will be directly evident to persons skilled in the art that present invention can be used for many, particularly, narrow-band multimedia applications.

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CLAIMS

1. A cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations,

5 each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable graphic display unit adapted to communicate with said network, via a mobile station, using said short message service (SMS) and, in response to receipt of SMS messages, to selectively display stored graphic images and to selectively superpose stored geographically related information symbols on a displayed image.

10 2. A system as claimed in claim 1, characterised in that said at least one graphic display unit forms part a portable personal computer (PPC), and in that said PPC is adapted to communicate with said network, via a mobile station, using said short message service (SMS).

15 3. A system as claimed in claim 2, characterised in that said graphic map images and symbols are stored by said PPC.

20 4. A cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS) and including a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, characterised in that said system includes at least one portable personal computer (PPC) adapted to communicate with a mobile station using said short message service (SMS), said PPC including a display screen; storage means having stored therein a series of graphic map images and a number of geographically related

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information symbols for selective display on said display screen, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and selection means, responsive to receipt of SMS messages, for selectively retrieving a map image and symbols from said storage means for display on said display screen.

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5. A system as claimed in any preceding claim characterised in that said information symbols, superposed on a displayed map image, are continually updated with current information by said SMS messages.

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6. A system as claimed in any preceding claim, characterised in that said graphic map images and information symbols are stored in a CD-ROM and/or a hard disc.

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7. A system as claimed in claim 6, when appended to any of claims 2 to 5, characterised in that said CD-ROM and/or a hard disc forms part of said PPC.

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8. A system as claimed in any preceding claim, characterised in that said stored information symbols are predefined and adapted for various applications, and in that an SMS message defines at least one symbol required to be displayed, together with its geographic coordinates.

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9. A system as claimed in claim 7, when appended to any of claims 2 to 7, characterised in that said PPC is adapted, on receipt of said SMS message, to superpose said at least one symbol on a graphic map image of the geographic area concerned, at a position defined by said geographic coordinates.

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10. A system as claimed in any preceding claims, characterised in that said information symbols include text information and an arrow adapted to be pointed at geographic coordinates of a map image defined by an SMS message.

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11. A system as claimed in any preceding claim, characterised in that a SMS cell broadcast facility is used to distribute messages defining geographically related information considered to be of general application by a network operator.

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12. A system as claimed in claim 11, characterised in that said SMS messages are used to continually updated information symbols, superposed on a displayed graphic map image, with current information.

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13. A system as claimed in claim 11, or claim 12, characterised in that said SMS cell broadcast facility is adapted to limit the volume of distributed information by transmitting a number of SMS messages, for different applications, over different geographic locations.

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14. A system as claimed in any of claims 11 to 13, characterised in that said SMS messages are repeatedly broadcast, at intervals, for a period of time during which a message is valid.

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15. A system as claimed in any of claims 11 to 14, characterised in that said SMS messages include an indication, identifiable by a mobile station, that previously transmitted information is being updated.

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16. A system as claimed in any of claims 11 to 15, characterised in that said SMS cell broadcast facility is used for the distribution of messages concerning the current weather situation, in different geographic areas; local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies, bank, retail outlets and the like; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the race.

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17. A system as claimed in any of claims 1 to 10, characterised in that SMS messages are addressed to unique users, or groups of users.

5 18. A system as claimed in claim 17, characterised in that said SMS messages define geographic related information selected by a network user.

19. A system as claimed in claim 18, characterised in that said geographically related information is for a limited geographic area.

10 20. A system as claimed in claim 19, characterised in that said limited geographic area is local to a user, or group of users, for whom the information has been requested, and in that the geographic limits are indicated either manually, or through use of a mobile station position-fixing facility.

15 21. A system as claimed in claim 20, characterised in that said manual indication is given by an area marked on a synoptical map by said user, or group of users.

20 22. A system as claimed in claim 19, characterised in that said limited geographic area is local to a user, or group of users, for whom the information has been requested, in that a mobile station of said user, or each member of said group of users, is provided with a GPS receiver for determining said mobile station's geographic location, and in that said mobile station is adapted to transmit said location information to a service provider using said SMS message facility.

25 30 23. A system as claimed in any of claims 17 to 22, characterised in that said SMS messages addressed to unique users, or groups of users, are adapted for use during military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of

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other taxis in the same taxi fleet.

24. A system as claimed in any preceding claim characterised in that said cellular radio communication network is a GSM network.

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25. In a cellular radio communication system including a cellular radio communication network adapted to provide a short message service (SMS), in which said network includes a plurality of mobile telephone stations and a number of base stations, each one of which is connected to a public switched telephone network and adapted to communicate with a number of said mobile stations, a method for distributing and displaying geographically related information using SMS messages, characterised by the steps of:

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- storing a series of graphic map images and a number of geographically related information symbols for selective display on a portable display unit, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and

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- in response to receipt of SMS messages from said network, retrieving and displaying a stored map image and symbols defined by said SMS messages.

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26. A method as claimed in claim 25, characterised by the step of continually updating the information symbols, superposed on a displayed map image, with current information defined by said SMS messages.

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27. A method as claimed in claim 25, or claim 26, characterised by storing said graphic map images and information symbols in a CD-ROM and/or a hard disc.

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28. A method as claimed in claim 27, characterised in that said CD-ROM and/or a hard disc forms part of a PPC.

5 29. A method as claimed in any of claims 25 to 28, characterised in that said stored information symbols are predefined and adapted for various applications, and in that an SMS message defines at least one symbol required to be displayed, together with its geographic coordinates.

10 30. A method as claimed in claim 29, characterised in that, on receipt of said SMS message, said at least one symbol is superposed on a displayed graphic map image at a position defined by said geographic coordinates.

15 31. A method as claimed in any of claims 25 to 30, characterised in that said information symbols include text information and an arrow adapted to be pointed at geographic coordinates of a map image defined by an SMS message.

20 32. A method as claimed in any of claims 25 to 31, characterised by distributing SMS messages using a SMS cell broadcast facility of said network, said distribute messages defining geographically related information considered to be of general application by a network operator.

25 33. A method as claimed in claim 32, characterised by the step of using said

SMS messages to continually update information symbols, superposed on a displayed graphic map image, with current information.

34. A method as claimed in claim 32, or claim 33, characterised by the step transmitting a number of SMS messages, for different applications, over different geographic locations, in order to limit the volume of distributed information by each of said SMS messages.

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35. A method as claimed in any of claims 32 to 34, characterised by the step of repeatedly broadcasting said SMS messages, at intervals, for a period of time during which a message is valid.

5 36. A method as claimed in any of claims 32 to 35, characterised by the step of including, in said SMS messages, an indication, identifiable by a mobile station, that previously transmitted information is being updated.

10 37. A method as claimed in any of claims 32 to 36, characterised by the step of using said SMS cell broadcast facility for the distribution of messages concerning the current weather situation, in different geographic areas; local tourist information; road information; traffic information; the geographic locations of petrol filling stations of different companies; the availability of hotel vacancies; and, in a sailing boat race, the relative positions of the boats in the
15 race.

38. A method as claimed in any of claims 25 to 31, characterised by the step of addressing said SMS messages to unique users, or groups of users.

20 39. A method as claimed in claim 38, characterised in that said SMS messages define geographic related information selected by a network user.

40. A method as claimed in claim 39, characterised in that said geographically related information is for a limited geographic area.

25 41. A method as claimed in claim 40, characterised in that said limited geographic area is local to a users, for whom the information has been requested, and in that the geographic limits are indicated either manually, or through use of a mobile station position fixing facility.

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42. A method as claimed in claim 41, characterised by the step of said user, or group of users, giving said manual indication by marking an area on a synoptical map.

5 43. A method as claimed in claim 41, characterised in that said limited geographic area is local to a user, or group of users, for whom the information has been requested, in that a mobile station of said user, or each member of said group of users, is provided with a GPS receiver, and in that said method includes the steps of determining a geographical location of a mobile station using said GPS receiver, and transmitting said location information to a service provider using said SMS message facility.

10 44. A method as claimed in any of claims 38 to 43, characterised in that said SMS messages addressed to unique users, or groups of users, are used during 15 military exercise, or by police forces on reconnaissance, fire-fighters fighting a fire, such as a forest fire, or a taxis driver to determine the location of other taxis in the same taxi fleet.

15 45. A method as claimed in any of claim 25 to 44, characterised in that said cellular radio communication network is a GSM network.

20 46. An arrangement for distributing and displaying geographically related information using a SMS message facility of a cellular mobile radio communication network, characterised in that said arrangement is adapted to 25 operate in accordance with a method as claimed in any of claims 25 to 45, or uses a system as claimed in any of claims 1 to 24.

25 47. A receiver for use with a system as claimed in any of claims 1 to 24 characterised in that said receiver includes a transceiver; storage means 30 storing a series of graphic map images and a number of geographically related

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information symbols for selective display, each one of said symbols being adapted to be selectively superposed on a displayed map image to indicate geographically related information; and display means for displaying said graphic map images and said symbols, responsive to communication with said transceiver.

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48. A receiver as claimed in claim 47, characterised in that said transceiver is a GSM transceiver adapted to receive and transmit SMS messages defining geographically related information.

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49. A receiver as claimed in claim 47, or claim 48, characterised in that said transceiver includes a GPS receiver.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 98/00950

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: H04Q 7/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPAT, WPI, JAPIO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0748139 A2 (NOKIA MOBILE PHONES LTD.), 11 December 1996 (11.12.96), column 8, line 10 - column 9, line 43; column 16, line 1 - line 11, figure 4 --	1-49
Y	EP 0647076 A1 (COMPAGNIE FINANCIERE POUR LE RADIOTELEPHONE, (COFIRA) S.A.), 5 April 1995 (05.04.95), column 1, line 51 - column 7, line 3, abstract --	1-49
A	EP 0752793 A2 (NOKIA MOBILE PHONES LTD.), 8 January 1997 (08.01.97) --	1-49

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See patent family annex.

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Date of the actual completion of the international search

7 August 1998

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No. PCT/SE 98/00950
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9535636 A1 (GTE LABORATORIES INCORPORATED), 28 December 1995 (28.12.95) --	1-49
A	WO 9521511 A1 (PACE, HAROLD), 10 August 1995 (10.08.95) -- -----	1-49

INTERNATIONAL SEARCH REPORT

Information on patent family members

30/06/98

International application No.
PCT/SE 98/00950

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
EP 0748139 A2	11/12/96	GB 2301987 A GB 9511337 D		18/12/96 00/00/00
EP 0647076 A1	05/04/95	FR 2711023 A,B FR 2711033 A,B		14/04/95 14/04/95
EP 0752793 A2	08/01/97	US 5604921 A		18/02/97
WO 9535636 A1	28/12/95	CA 2169955 A EP 0714589 A JP 9502333 T US 5519760 A		28/12/95 05/06/96 04/03/97 21/05/96
WO 9521511 A1	10/08/95	AU 2114895 A CA 2170737 A CN 1126539 A US 5712899 A		21/08/95 10/08/95 10/07/96 27/01/98

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